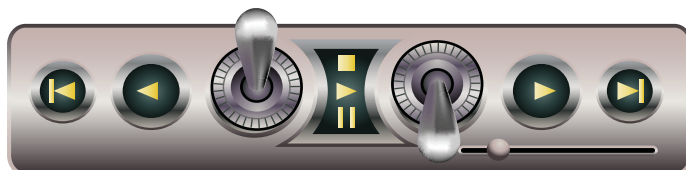


# Flight Surgeon Refresher Course

## Section 3: Aeromedical Training

Stress  
(FSRC301)

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# STRESS

## Introduction

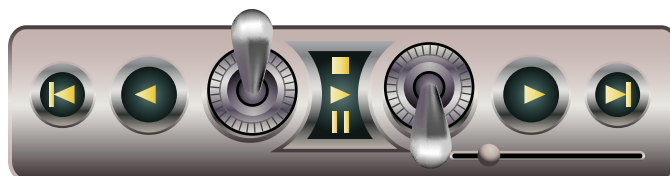
Army aircrew members are involved in stressful situations that are a daily part of the operational environment. Long hours, noise, vibration, altitude and potential mechanical malfunctions are just a few examples of aviation stressors.

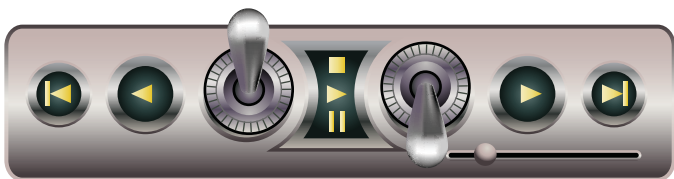
Aircrew members must make instantaneous decisions, some of which may be life threatening. Since the research literature and experience tell that stress and fatigue can affect decision making in the cockpit, it is imperative that aircrew are aware of and minimize the effects of stress.

Stress is a health risk for everyone, but these risks increase in the aviation environment. Flying is dangerous enough by itself, so avoid making it even more so by letting stress interfere with your duties.

### Objectives:

- a. Define stress.
- b. Describe different categories of stressors.
- c. Describe the relationship between stress and performance.
- d. Describe the physical, cognitive, emotional and behavioral responses to stress overload.
- e. Describe stress coping mechanisms.
- f. Describe the effects and countermeasures for combat stress.





## What is stress?

Around 1926 Hans Selye, an Austrian endocrinologist, identified a consistent pattern of mind-body reactions that he called “the nonspecific response of the body to any demand.” He later referred to this pattern as the “rate of wear and tear on the body.”

Selye’s definition of stress is necessarily broad, because stress is a broad concept. However, it incorporates two very important points:

- Stress is a physical or “body” phenomenon
- Stress involves some “demand” placed upon an individual.

## How does the body respond to stress?

When the body perceives a threat or challenge, a number of immediate physiological changes occur:

- Adrenaline rush produces heightened arousal and awareness
- Heart rate and blood pressure increase
- Pupils of the eyes dilate for better vision
- Lungs take in more oxygen
- Bloodstream brings extra oxygen and glucose into circulation for fuel
- Digestion stops to allow the body to focus its energy in the muscles

These physical reactions are collectively known as the “Fight or Flight Response.” If the stress response is activated too often, it can result in damage to the immune system, brain and heart.

## Stress and Performance

How one performs under stress varies according to four major factors:

1. **The amount of mental effort or concentration required to perform a task.** In general, stress decreases performance in simple tasks, such as filling sandbags much less than complex tasks, such as flying a helicopter.

2. **The environment in which a task is performed.** For example, a student will do much better on a written achievement test if he is working in a quiet, comfortable room as opposed to working in a hot, noisy room.
3. **The biological makeup of the individual.** For example, an individual prone to fatiguing easily will not make a good Army Aviator, where long hours and night flights are common.
4. **Personality and mental health.** Individuals prone to obsession, perfectionism and rigid thinking are less likely to perform well under stress than those persons with more flexible, realistic problem solving and decision making skills.

## Response to Stress

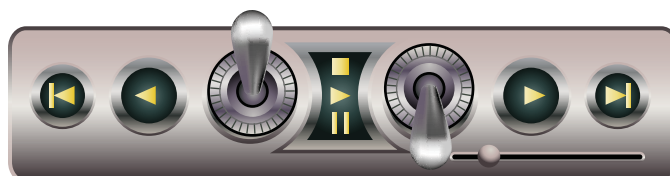
The stress of everyday life can become so great that it overloads our coping skills. In general, responses to stress overload fall into one of four categories:

1. Physical
2. Cognitive
3. Emotional
4. Behavioral

## Physical responses to stress:

The **immediate** PHYSICAL response to a stressful situation involves overall heightened arousal of the body:

- Increased heart rate
- Increased blood pressure
- Rapid breathing
- Tensing of the muscles
- The release of sugars and fats into circulation to provide fuel for “fight or flight.”



**Prolonged** stress and its continuous effects on the body may produce longer-term physical symptoms:

- Muscle tension and pain
- Headaches
- High blood pressure
- Gastrointestinal problems
- Decreased immunity to infectious diseases

Individuals who deal with anxiety and stress primarily through denial will experience physical symptoms as manifestations of stress. Frequent visits to sick call for minor medical problems may arise more from poor stress management rather than from any real physical illness.

### Cognitive responses to stress:

Prolonged stress may affect cognition (thinking) as well as emotions and behavior. This is a serious issue for aircrew, because problems with judgment, attention or concentration jeopardize personnel, the mission and the aircraft.

Some common stress-related cognitive problems are:

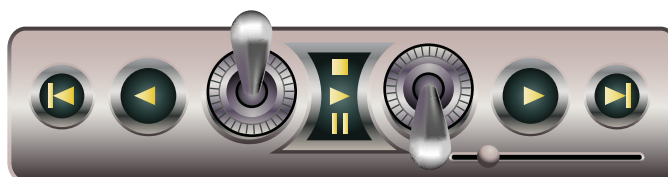
- **Simplification Heuristic:** People under high stress tend to oversimplify problems and ignore important relevant information; in other words, “taking the easy way out,” instead of thinking through a problem in a rational manner, as they would under less stressful conditions.
- **Stress-Related Regression:** Many individuals under high stress conditions forget learned procedures and skills and revert to bad habits. For example, a student aviator preparing for take-off may forget to turn the fuel switch on and then, realizing the problem and feeling stressed and embarrassed, turn the switch on and risk overheating the engine. This action is clearly contrary to his training and represents a kind of regression or failure to utilize prior learning.
- **Perceptual Tunneling:** An individual or an entire crew under high stress becomes focused on one stimulus, like a warning signal (e.g. caution light), neglecting other important tasks or information, such as flying the aircraft. A similar situation may occur when an aviator realizes during flight that he overlooked some aspect of flight, such as missing a radio

communication. The aviator might over-attend to rectifying this problem and/or become emotionally and mentally fixated on the error and fall “behind the aircraft,” missing new information and further compromising the mission or safety of flight. Beyond affecting memory, judgment and attention, stress can even decrease hand-eye coordination and muscle control.

### Emotional responses to stress:

- Emotional responses to stress overload range from anxiety and irritability to social withdrawal, depression or even suicide.
- Some depressed individuals experience anhedonia, an extreme loss of pleasure in activities that were once enjoyable. Persons suffering from prolonged stress overload may lose interest in hobbies and other leisure activities and find little happiness in life.
- Stress overload also affects how we behave at work, at home, and socially. For example, lateness to work or a drop in work productivity can be signs of stress overload.
- At times, stress may become so severe that alcohol is used to self-medicate anxiety or depression. Using alcohol as a coping strategy is particularly dangerous, because it impairs judgment and increases impulsivity and can result in suicide or violence in the home or workplace.

**WARNING** Suicidal thoughts can be a result of stress overload. You do not need to have a history of mental health problems to consider committing suicide. Extreme stress, like the loss of a loved one, may cause previously healthy people to feel hopeless and consider harming themselves.



## Stress Underload

- The effects of stress “underload” are of particular concern in peacekeeping operations.
- In such operations, crewmembers will often have a considerable amount of unstructured time, work tasks can become monotonous and soldiers become bored.
- Consequently, it is important for leaders to minimize unstructured time as much as possible, using it as an opportunity for MOS skills training, cross training, physical training or other activities designed to challenge and develop soldiers.

## Is stress always bad?

Having too little stress in one's life can be as dysfunctional as having too much stress.

A lack of challenges can lead to complacency, boredom, impulsive risk-taking, and alcohol or other substance abuse.

Individuals should strive to balance the stress in their lives in order to be optimally challenged without overwhelming their coping resources.

## Stressors

**Stressor:** Any stimulus that causes a person to adjust physiologically, emotionally or behaviorally.

### Categories of stressors:

- Environmental
- Psychosocial stressors
- Cognitive stressors
- Alcohol

## What are Environmental Stressors?

There are many stressors unique to the aviation environment:

- **Altitude:** Stress caused by altitude is most evident below 5,000 feet, where the greatest atmospheric pressure changes occur. Aircrew members are subject to problems resulting from trapped gas (barotrauma) most often at lower altitudes— even a common cold can cause ear and sinus problems. Because flights seldom exceed an altitude of 18,000 feet, hypoxia and evolved gas problems, such as the bends, are not common sources of stress for Army aviators.
- **Heat/ Cold:** Heat from direct sunlight entering through the canopy or tropical climates can impair aircrew performance, causing fatigue, dehydration, heat exhaustion or other problems. Low temperatures at high altitude or in arctic climates, can cause shivering, hypothermia or other stressful physical problems.
- **Speed:** Flight involves speeds greater than those experienced in the everyday, earthbound environment. High speeds are stressful because they require air crewmembers to be alert and focused for prolonged periods.

## Danger signs of suicidal behavior:

Depression

Substance abuse

Risky or dangerous behavior

Giving away possessions

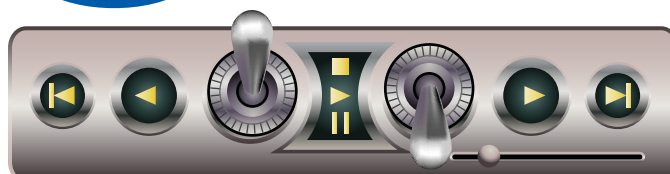
Getting one's affairs in order (making out a will, paying off debts, etc.)

Expressing a desire to die or threatening suicide

A drop in work or school performance

### Take these warning signs seriously!

If you observe these signals in a family member, friend or coworker, you should talk to them supportively and refer them to a mental health professional, their command structure or the flight surgeon immediately.



- **Weather:** Flying in poor weather or at night in instrument flight conditions imposes significant stress and increases aircrew fatigue. Awareness of a greater potential for danger and increased vigilance and accuracy in reading, following, and monitoring flight instruments are very stressful. There is a high correlation between adverse weather and increased accident rates.
- **Ergonomics:** Aviator performance is also greatly affected by human factors engineering (ergonomics). Good ergonomic design of cockpit illumination, instrument location, accessibility of switches and controls, and seat comfort is essential to reduce aircrew stress. Other influential human factors are the adequacy of heating and ventilation systems, cockpit visibility and noise reduction. When such factors are inadequate or uncomfortable, aircrew members will experience increased stress, and their attention may be diverted from performing operational duties.

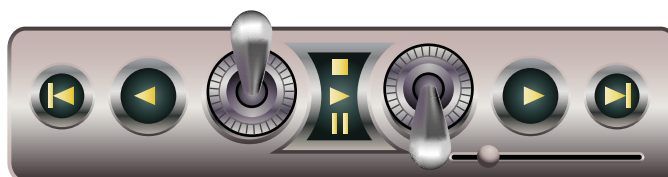
### What Are Psychosocial Stressors?

- Relationships, career and finances, and other factors that influence these areas, such as physical health
- Frequent deployments
- The dangers of flight operations are significant stressors for aircrew and their families.
- Families that are poorly prepared to deal with these stressors can create more stress with arguments and conflict that can adversely affect an air crewmember's performance.
- Work stress: reassignment, promotion, conflict with co-workers, or lacking the training or experience required to perform one's duties all cause stress.
- It is important to note that positive life events can be as stressful as negative ones. The birth of a child, getting married, or a promotion can all induce stress.

### What Are Cognitive Stressors?

We can increase our stress by the way we view situations and events. Cognitive bad habits convert our thoughts into stressors in their own right:

- **All or nothing thinking:** a lack of flexibility in one's expectations for life events. Self-talk such as, "Either I get an award for my work performance or I am a total failure" is an example. People that think only in absolutes cannot see gray, only black or white. In other words, they have no tolerance for ambiguity. Unfortunately, there are many uncertainties and ambiguities in life that one must confront and learn to manage.
- **Failure to focus on the present:** distracting oneself from the task at hand by worrying about past mistakes or the future. Because one cannot change the past or control the future, such thinking is maladaptive. It is important to plan for the future, but to do so without obsessive concern about the consequences of failure. Simply devise the best plan possible and follow it through.
- **Perfectionism:** Like all or nothing thinking, perfectionism and overuse of the words "must" and "should" in thought processes can create rigid expectations that might be impossible to fulfill. Although it is important to have standards and goals, it is important to be prepared when they are not met.
- **Passivity:** Passively standing by, allowing others to ignore your needs and opinions results in a lack of control over your environment. Being assertive and having the courage to stand up for beliefs can decrease stress. Allowing oneself to become a "doormat" may result in chronically poor physical health, poor social and occupational functioning and/or emotional problems.





## Is alcohol a stressor?

Yes. Alcohol is a self-imposed stressor.

- Alcohol produces significant changes in the body's systems. These changes are present long after the alcohol has been metabolized.
- Alcohol reduces the cells' ability to transport oxygen, depresses the central nervous system, causes dehydration, and impairs perception and judgment, to name just a few of its effects.
- All air crewmembers should be aware of the residual hangover effects of alcohol, which can be detrimental to performance even though there is not a detectable level of blood alcohol present.
- As a general rule, the body takes about 1 hour to metabolize 1 oz of pure alcohol. Women tend to metabolize more slowly (approximately 1.5 hours for 1 oz) and there is a tremendous amount of variability between persons.
- AR 40-8 states that aviators must avoid consuming alcohol 12 hours prior to beginning flying duties (the initial pre-flight duties for the day), and all residual effects of alcohol must be gone from the aviator's system at that time.

Alcohol is a potential hazard for aircrew members and should be managed like any other hazard, by risk assessment and developing and implementing control measures.

Each crewmember must personally assess his or her risk for developing a problem with alcohol and adjust consumption accordingly.

## Stress Coping Mechanisms

Coping mechanisms are ways of thinking and acting that help one manage the various demands encountered in life.

What are some stress coping mechanisms?

1. **Avoid stressors:** Avoiding stressors is the most powerful technique for managing stress, because it prevents one from experiencing the full effect of a stressor. However, avoiding does not mean running away from stress.
2. **Change your thinking:** How one thinks about stress partially defines one's reaction to it, often creating a self-fulfilling prophecy.
3. **Relax:** Relaxation is an essential but underutilized coping technique. It is impossible to be relaxed and stressed at the same time. Find a relaxation technique that works for you and use it regularly.
4. **Venting:** Venting is "letting off steam" either by talking to someone or physically through exercise.

## Who is at risk of developing a problem with alcohol?

One factor to consider in your personal risk assessment is your family history. If your father, mother or grandparents have abused alcohol, you are at a much greater risk of developing an alcohol problem than is someone without such a family history.

Using alcohol as a stress coping mechanism also puts you at serious risk for developing a problem. It is very important to have ways to relax that do not involve alcohol.

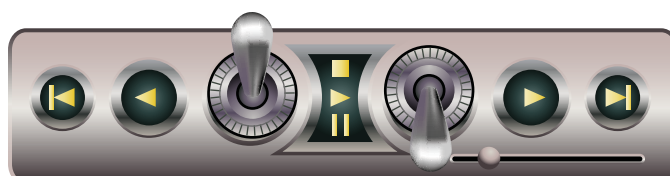
## Combat Stress

Combat Stress is an extreme form of stress that results from the combination of numerous severe stressors that are encountered on the battlefield.

## What are some behaviors induced by combat stress?

**Positive effects:** heightened alertness, strength and endurance; acts of courage and self-sacrifice; and strong personal bonding between soldiers.

**Negative effects:** Battle fatigue and misconduct, such as fratricide, killing of prisoners, and desertion may result from the stress of the battlefield.





## Counteracting combat stress:

There is no way to prevent combat stress, but its effects can be ameliorated.

- Combat stress control is the responsibility of every unit commander. Commanders and their staff must consider potential stress factors such as the intensity of battle, fatigue and the availability of basic needs such as food and water when planning missions.
- When executing a mission, the chain of command must be attentive to the stress levels of individual soldiers and group factors, such as morale and cohesion. When problems arise in any of these areas, action must be taken to control the stress threat, such as improving the flow of information or redistributing the workload or resources more equally. Resources from outside the unit may also be called on for assistance, such as requesting a combat stress control team to conduct a critical incident stress debriefing after a mishap or heavy losses in combat.

Although physical fatigue, which will be discussed in a separate lesson, contributes to battle fatigue, it is important to understand that battle fatigue potentially involves much more than simply being physically tired.

## Signs of severe battle fatigue:

Impaired speech or muteness

Impaired vision, touch, or hearing

Paralysis

Hallucinations

**Severe battle fatigue requires immediate treatment in order to return a soldier to combat effectiveness.**

## Signs of mild battle fatigue:

Hyperalertness

Irritability

Loss of confidence

## What are some considerations when treating battle fatigue?

Follow the acronym "PIES"

**P – Proximity:** Deal with a soldier's signs of battle fatigue as geographically close to his or her unit as possible. Avoid the delay of evacuating the affected soldier back to garrison for treatment.

**I – Immediacy:** Treat a soldier's signs of battle fatigue as soon as possible after the signs become apparent. The longer a soldier's stress reactions are left untreated, the greater the potential they may worsen.

**E – Expectancy:** Create the expectation in the soldier that his signs of battle fatigue are normal reactions to abnormally severe stressors, and that he or she will recuperate quickly with adequate rest. The soldier should not be labeled as a medical or psychiatric casualty. Psychiatric labeling creates an "illness" mindset in the soldier, and the soldier will behave as a casualty rather than as a recuperating soldier.

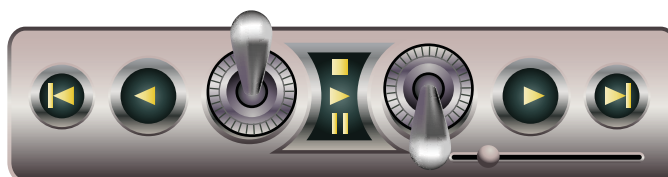
**S – Simplicity:** Keep treatment simple. "Three hots and a cot" is the traditional guideline for care

## Battle Fatigue

Battle fatigue is a trauma-induced cognitive, emotional, and/or psychosomatic impairment that can range from mild signs experienced by many soldiers to very severe signs that can render soldiers non-mission capable.

Although the term "Battle Fatigue" seems to carry with it an implication of being "exhausted" or "tired," it is more than simple fatigue.

It is a type of stress reaction to an abnormally severe and unusual stressor, the combat environment.



of battle-fatigued soldiers. No psychotherapy or intensive counseling is necessary— just rest, adequate food, and social contact. If the soldier is able, he or she should be encouraged to work at simple tasks, and should be in duty uniform during duty hours. This helps reinforce the expectancy that she will recover quickly and return to her unit.

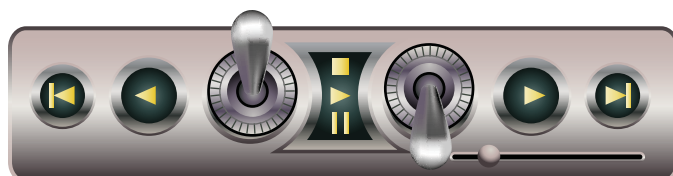
## **W**hat counseling resources are available for aircrew?

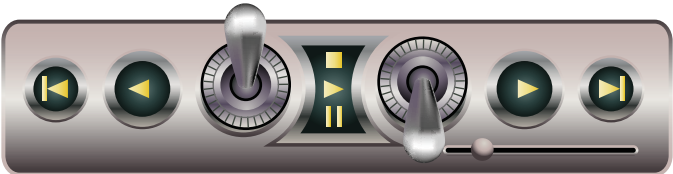
The Army offers a number of resources for ventilating stress through counseling:

The Flight Surgeon can make referrals to mental health officers and is a good resource if you are uncertain what mental health services are offered. Aeromedical psychologists should be utilized when available.

Many chaplains provide counseling services, especially for marital problems.

ASAP, the Alcohol and Substance Abuse Program provides information and treatment for soldiers whose use of alcohol has begun to negatively affect their work and/or family life.





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